

MAXDATA Server PLATINUM 3200 I

User's Manual

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1 Setting up the System

Server Position

Please take note of the following criteria for creating a practical and safe workplace when setting up your computer:

-  The system can be used anywhere the temperature is suitable for people. However, rooms with humidity over 70 %, and dusty or dirty areas are not appropriate. In addition, do not expose the server to any temperatures over +30 °C or under +10 °C.
-  Make sure that the cables connecting the server to peripheral devices are not tight.
-  Make sure that all power and connection cables are positioned so that they are not trip hazards.
-  When you save data to your server's hard disks or to a floppy disk, they are stored as magnetic information on the media. Make sure that they are not damaged by magnetic or electromagnetic fields.
-  Because the electronics in your computer can be damaged by jarring, no mechanical devices should be placed on the same surface as the server. This is especially important for impact printers whose vibrations could damage the hard disk.
-  Please take care to ensure a free air flow to the server at all times. Do not block the ventilation slots of the server case and particularly the power supplies. An insufficient air flow may damage the server and / or it's components.

ATTENTION

In order to fully separate the server from current, the power cord(s) must be removed from the wall outlet.

Back Panel Features

The diagram and table show the back panel connectors and LEDs. For information about LEDs, see “Light-Guided Diagnostics” on page 27.

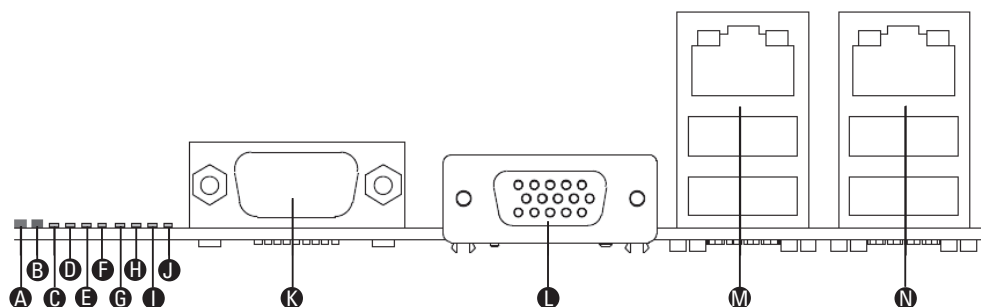


Figure 1. Back Panel Connectors and LEDs

- | | |
|--------------------------------------|---|
| A. Status LED | H. Diagnostic LED 2 |
| B. System Identification LED | I. Diagnostic LED 1 |
| C. Diagnostic LED 7 (MSB LED) | J. Diagnostic LED 0 (LSB LED) |
| D. Diagnostic LED 6 | K. Serial Port A |
| E. Diagnostic LED 5 | L. Video Port |
| F. Diagnostic LED 4 | M. NIC 1 (top, default management port),
two USB ports (bottom) |
| G. Diagnostic LED 3 | N. NIC 2 (top), two USB ports (bottom) |

The NIC LEDs at the right and left of each NIC provide the following information.

Table 1. NIC LEDs

LED Color	LED State	Description
Left LED	Off	No network connection is in place
	Solid Green	Network connection is in place
	Blinking Green	Transmit/receive activity is occurring
Right LED	Off	10 Mbps connection (if left LED is on or blinking)
	Solid Green	100 Mbps connection
	Solid Amber	1000 Mbps connection

Front Panel Controls and Indicators

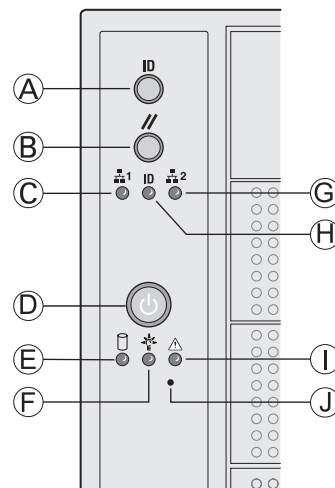


Figure 2. Pedestal Controls and Indicators

- | | |
|---|--------------------------------------|
| A. ID Toggle Switch | F. Power/Sleep LED (green) |
| B. Reset Button | G. NIC 2 Activity LED (green) |
| C. NIC 1 Activity LED (green) | H. ID LED (blue) |
| D. Power Button | I. Status LED (bi-color) |
| E. Hard Drive Activity LED (green) | J. NMI Button |

Descriptions of the front panel LEDs are listed in the following table.

Table 2. Description of Front Panel LEDs

LED Name	Color	Condition	Description
Power/Sleep LED	Green	ON	Power On
		OFF	Off
Status	Green	ON	System Ready
	Green	BLINK	System ready, but degraded: some CPU fault, DIMM killed
	Amber	ON	Critical alarm: Critical power module failure, critical fan failure, voltage (power supply), voltage and thermal fault
	Amber	BLINK	Non-critical failure: Redundant fan failure, redundant power failure, non-critical power and voltage
		OFF	AC power off; powered down (DC-off state or S5), and no degraded, non-critical, critical conditions exist*
Hard Drive Activity	Green	BLINK	Hard drive activity
NIC 1 Activity	Green	ON	Linked
	Green	BLINK	LAN activity
		OFF	Idle
NIC 2 Activity	Green	ON	Linked
	Green	BLINK	LAN activity
		OFF	Idle
ID LED (rack only)	Blue	BLINK	Server identification; Toggled by ID button or software
		OFF	Server identification; Toggled by ID button or software

* When the server is powered down (transitions to the DC-off state or S5), the BMC is still on standby power and retains the sensor and front panel status LED state established before the power-down event. If the system status is normal when the system is powered down (the LED is in a solid green state), the system status LED will be off.

2 Chassis Description

Feature Summary

Table 3. Feature Summary

Feature	P3200 I Description
Peripheral Bays	3 multi-mount 5.25 peripheral bays
Drive Bays (6 + 4) bay layout	One fixed drive bay for up to 6 hard drives Optional: Hot swap drive bay <ul style="list-style-type: none">• for 6 hard drives (SAS/SATA)• for 4 hard drives (SAS/SATA)• P3200 I Base: up to 6 drives P3200 I Redundant: up to 10 drives
Expansion Slots	Six full-length PCI expansion slots are available.
Form Factor	5U Tower, convertible to rack mount
Power Delivery	a) P3200 I Base: One fixed 670-W power supply with an integrated fan b) P3200 I Redundant Power: Two highly efficient, redundant 750-W hot swap power supplies with an integrated fan
Cooling	a) P3200 I Base: Three fixed, non-redundant chassis fans <ul style="list-style-type: none">• Two 120-mm fans: one at the front and one at the rear• One 92-mm fan at the front b) P3200 I Redundant: Four hot-swap, redundant chassis fans: <ul style="list-style-type: none">• Two 120 mm and two 92 mm fans at the front

Base – Chassis Front View

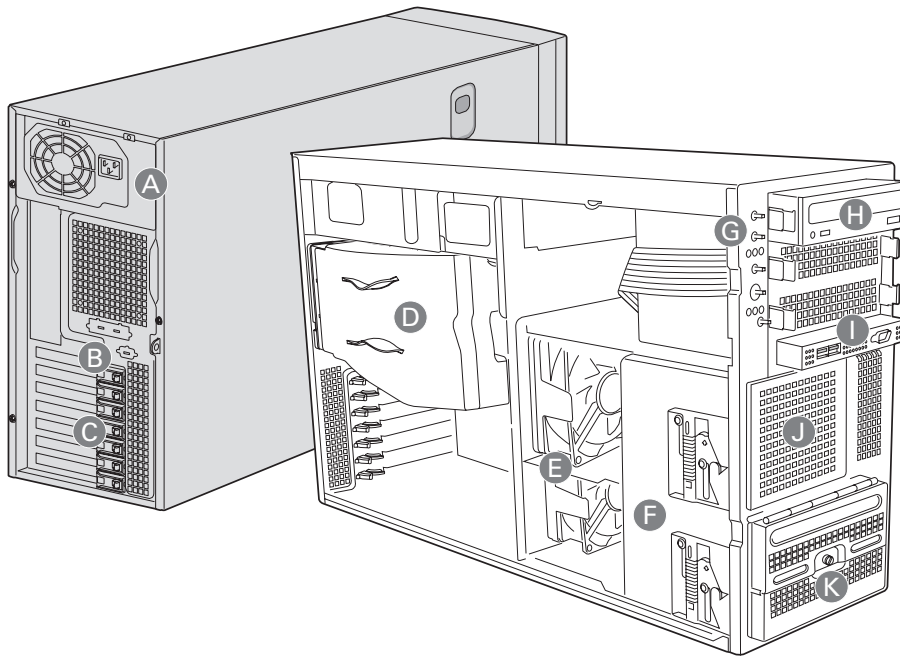


Figure 3. MAXDATA PLATINUM 3200 I Base – Overview

- A. Fixed Power Supply
- B. Rear Serial Port B
- C. PCI Add-in Card Panel
- D. Air Duct and Fixed Fan (rear)
- E. 2 Fixed Fans (front)
- F. 2 Hard Drive Cage Release Mechanisms
- G. Front Control Panel
- H. 5.25-inch Device Bay
- I. Front Panel USB / Serial B
- J. Hard Drive Cage – 4 Drive (accessory)
- K. Hard Drive Cage – 6 Drive

Redundant Power – Chassis Front View

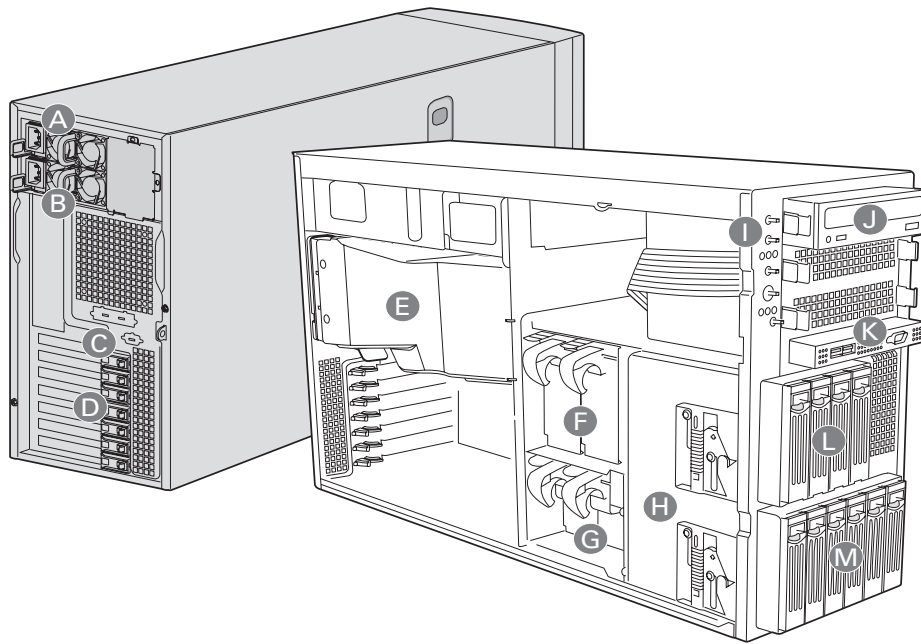


Figure 4. MAXDATA PLATINUM 3200 I Redundant Power – Overview

- A. Hot Swap Power Supply 1
- B. Hot Swap Power Supply 2
- C. Rear Serial Port B
- D. PCI Add-in Card Panel
- E. Air Duct
- F. 2 Large Hot Swap Fans
- G. 2 Small Hot-swap Fans
- H. 2 Hard Drive Cage Release Mechanisms
- I. Front Control Panel
- J. 5.25-inch Device Bay
- K. Front Panel USB / Serial B
- L. Hard Drive Cage – 4 Drive (accessory)
- M. Hard Drive Cage – 6 Drive (accessory)

Chassis Rear View

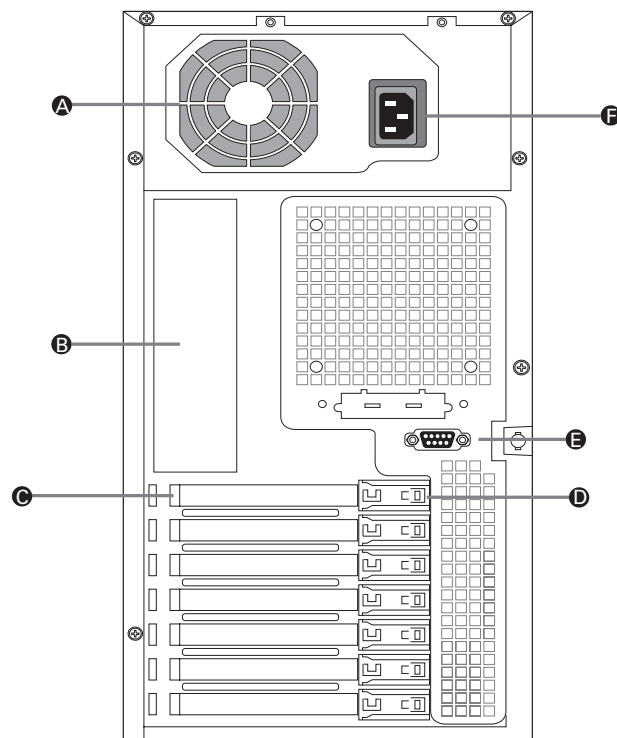


Figure 5. MAXDATA PLATINUM 3200 I Base – Chassis Rear View

- A.** Power supply
- B.** I/O Ports
- C.** Expansion Slot Covers
- D.** PCI Card Latch
- E.** Rear Serial B Connector (optional)
- F.** AC Power Connector

Peripherals

5.25-inch Halfheight Peripheral Bays

The upper bays of the server chassis are designed for removable media peripherals. Three 5.25-inch, half-height drive bays are available for floppy, CD-ROM or tape drives.

 NOTE

One multi-purpose 5.25-inch drive carrier is included with the chassis. This drive carrier can hold either a 3.5 inch drive (by removing the knockout) or a fixed drive.

3 Setting up the Chassis

This chapter describes how to set up your server chassis for the first time.

Tools and Supplies Needed

- Phillips (cross head) screwdriver (#2 bit)
- Small flat-head screwdriver
- Anti-static wrist strap (recommended)

Safety: Before You Remove the Access Cover

Before removing the access cover for any reason, observe these safety guidelines:

- Turn off all peripheral devices connected to the server.
- Turn off the server by pressing the power button on the front of the chassis. Then unplug the AC power cord(s) from the chassis or wall outlet.
- Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back of the chassis.
- Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground – any unpainted metal surface – when handling components.

Warnings and Cautions

These warnings and cautions apply whenever you remove the access cover(s) to access components inside the server. Only a technically qualified person should integrate and configure the server.



WARNINGS

The power button on the front panel DOES NOT turn off the AC power. To remove power from server, you must unplug the AC power cord(s) from the wall outlet or the chassis.

Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord(s), telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Hazardous voltage, current, and energy levels are present inside the power supply. There are no user-serviceable parts inside it; servicing should be done by technically qualified personnel.



CAUTIONS

ESD can damage disk drives, boards, and other parts. Perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground – any unpainted metal surface – on your server when handling parts.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. Do not touch the connector contacts. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. If you place the server board on a conductive surface, the battery leads may short out. If they do, this will result in a loss of CMOS data and will drain the battery. Use a conductive foam pad if available. Do not slide board over any surface.

For proper cooling and airflow, always install the access cover before turning on the server. Operating it without the cover in place can damage system parts.

Remove Primary Access Cover

When facing the front of the chassis, the Primary Access cover is on the left-hand side for pedestal-mounted servers, and on top for rack-mounted servers.

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Power off the system and disconnect the power cable.
3. If the shipping screw is installed, remove it (letter "A").
4. Press the latch (letter "B") and slide the Primary Access Cover toward the rear of the chassis.
5. Lift the Primary Access Cover outward to remove it.

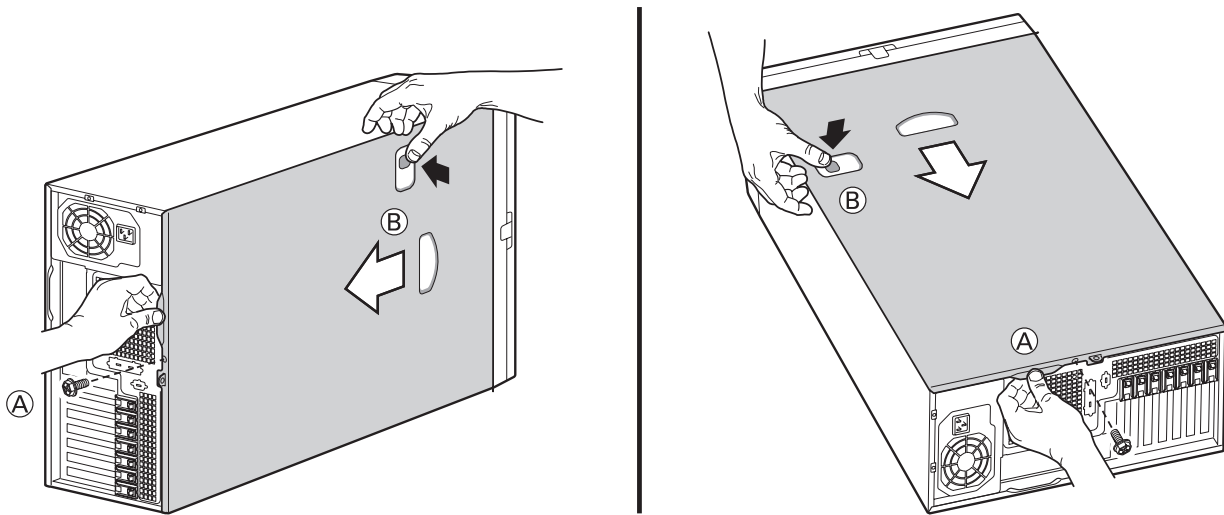


Figure 6. Removing the Access Cover

Remove Bezel Assembly

1. Release the two plastic tabs (letter "A") on the left side of the Bezel Assembly to disengage the tabs.
2. Rotate the Bezel Assembly (letter "B") no more than 40 degrees outward.
3. At a 40-degree angle, push the Bezel Assembly away from the chassis (letter "C"). If Bezel Assembly does not immediately disconnect from the chassis, then tap the left-hand side of the Bezel Assembly to disengage the bezel hooks on the right-hand side of the chassis.

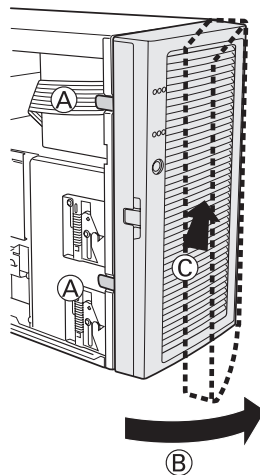


Figure 7. Removing Bezel Assembly

Install 3.5-inch Floppy, DVD, or CD-ROM Drive

1. Press pair of slides inward (letter "A") to release and pull slide/filler panel assembly out of device bay.

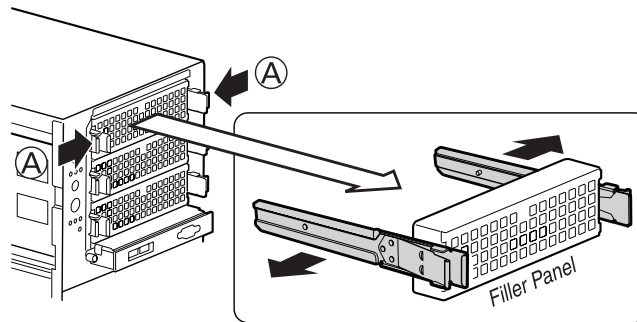


Figure 8. Removing Slide/Filler Panel Assembly from Upper Device Bay

2. Attach the slides to the drive by pressing the slides firmly into the side dimples on the drive.

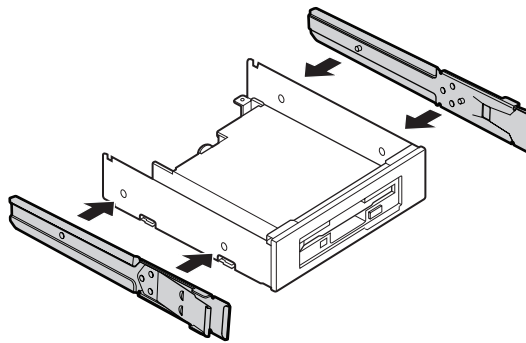


Figure 9. Installing Slides on 3.5-inch Floppy Drive

3. Insert the drive/slide assembly partially into the upper device bay. Connect power and data cables.
4. Finish inserting the drive/slide assembly into the chassis until the slides lock into place.

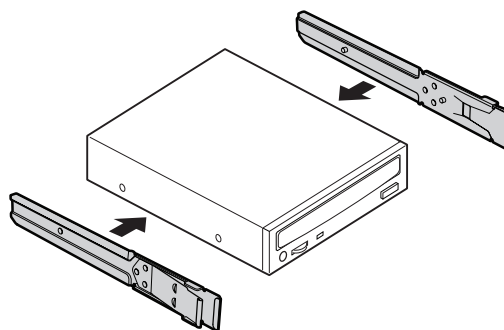


Figure 10. Installing a DVD or CD-ROM Drive

Install Fixed Hard Drive(s)

1. Push the blue plastic release mechanism upward to release the Fixed drive cage (letter "A"). Pull out the drive cage so that it is partially exposed (about 2 inches out) from the drive bay slot in the chassis (letter "B"). Partially exposing the drive cage will make it easier to open the upper door of the drive cage.

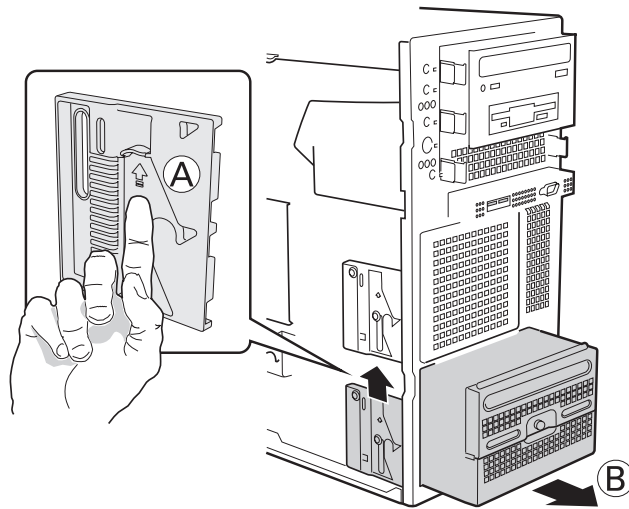


Figure 11. Removing Six-drive Fixed Drive Cage from Chassis

NOTE

As an alternative, you may also fully remove the drive cage from its drive bay slot in the chassis. Take care, however, to position the drive cage horizontally before opening the drive cage doors or the drive rails will spill out.

2. Loosen the captive screw (letter "A"). Open the upper door (letter "B").

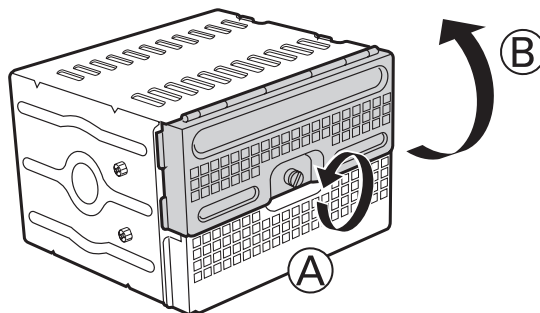


Figure 12. Unlocking and Opening Upper Drive Cage Door

3. Open the lower door.
4. Remove a pair of device slides from the drive cage.

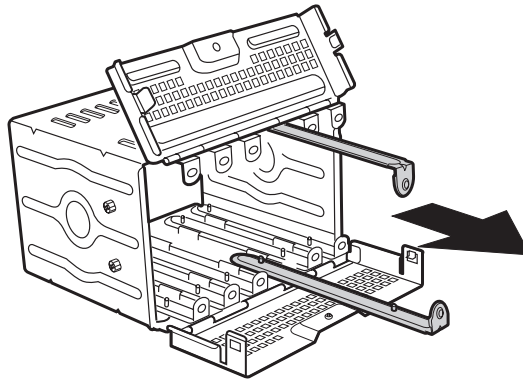


Figure 13. Remove Slides from Drive Cage Door

5. Attach the device slides to the hard drive. This is a tool-less operation. Insert tabs on device slides into mounting holes on hard drive and then press firmly to secure device slides to hard drive. Ensure that the metal tabs on the device slides are facing the front of the hard drive and facing towards each other.

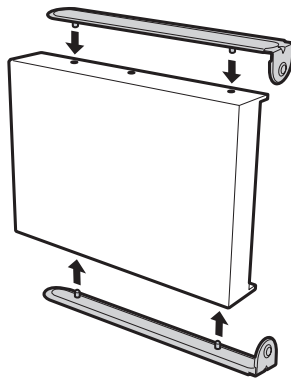


Figure 14. Installing Device Slides to Hard Drive

6. Insert drive/slide assembly into drive cage. Make sure that the cable connector end of the hard drive faces towards the rear of the drive cage. The top of the drive is in the same orientation as the arrow in the following illustration.

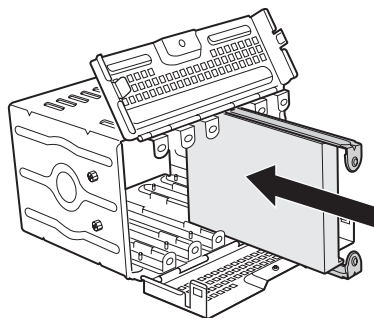


Figure 15. Inserting Drive/Slide Assembly into Drive Cage

7. Repeat steps 4-5 for installation of additional hard drives into drive cage.
8. Close the lower door of drive cage.
9. Close the upper door of drive cage.
10. Tighten the thumb screw. Install power and data cables to connectors on hard drive(s).

Install Hot Swap Drive(s)

1. Press in on the green latch (letter "A") at the end of the drive carrier to disengage it from the hot swap drive cage. Pull out on the black lever (letter "B") to fully open the drive carrier. When the lever reaches a fully opened position, it will push the drive carrier out from the hot swap drive cage.

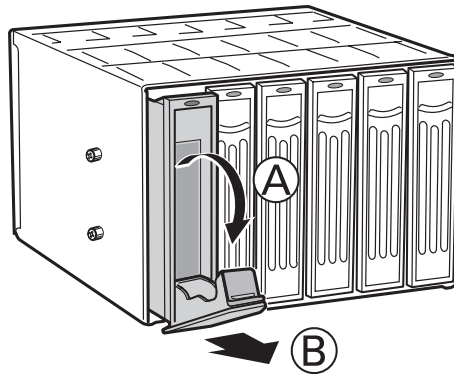


Figure 16. Releasing Drive Carrier from Hot Swap Cage

2. Slide the drive carrier out of the drive cage.
3. Remove the four screws that secure the plastic retention device to the drive carrier. Remove the plastic retention device.

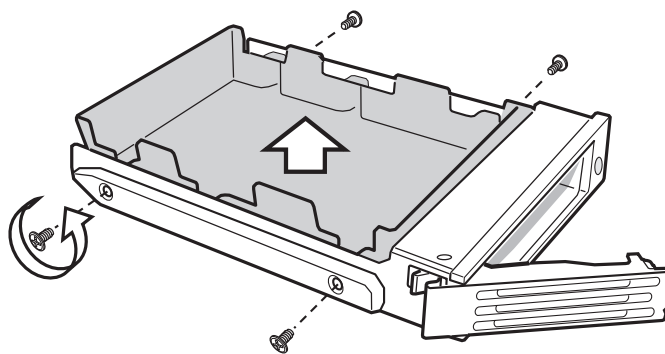


Figure 17. Removing Plastic Retention Device

4. Secure the hard drive to the drive carrier using the four screws that were formerly attached to the plastic retention device. Ensure that the connector end of the hard drive is facing the back of the drive carrier. The label side of the hard drive should be facing up in the drive carrier.

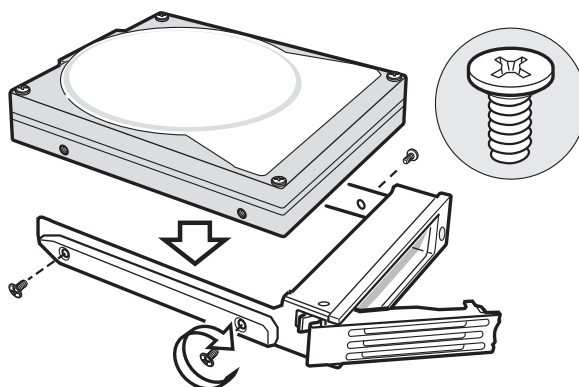


Figure 18. Securing Hard Drive to Drive Cage

5. With the black lever open, insert the drive carrier into the drive cage. Once inserted, rotate the black lever upwards to latch the drive carrier into position.

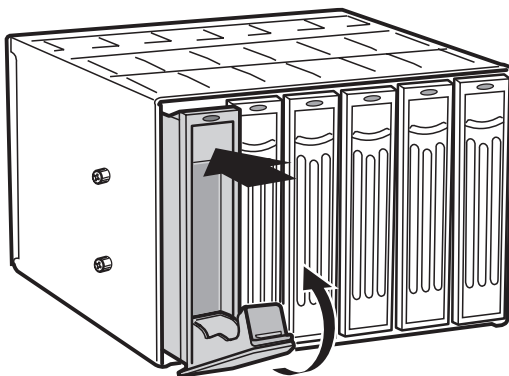


Figure 19. Inserting Drive Carrier into Drive Cage

4 Server Board Features

This chapter briefly describes the main features of the PLATINUM 3200 I Server Board. It provides a list of the server board features and diagrams showing the location of important components and connections on the server board.

Table 4. Server Board Features

Feature	Description
Server board	Intel® S5520HC
Processor	One or two Intel® Xeon® 5500 processors with a thermal design power (TDP) of up to 95 W
System memory	<ul style="list-style-type: none">• 12 DIMM slots, 6 per processor, distributed over three memory channels• Up to 96 GB system memory• 800/1066/1333 MT/s ECC registered (RDIMM) or unbuffered (UDIMM) DDR3 memory• No mixing of RDIMMs and UDIMMs
Chipset	<ul style="list-style-type: none">• Intel® 5520 Chipset IOH• Intel® 82801Jx I/O Controller Hub (ICH10R)
Peripheral interfaces	<p>External connections:</p> <ul style="list-style-type: none">• One DB-15 graphics port• One serial DB9 port A• Two RJ45 network ports for 10/100/1000 Mbps• Four USB 2.0 ports (back panel) <p>Internal connections:</p> <ul style="list-style-type: none">• Two USB connectors for each of the two USB 2.0 ports (2 leading to the front)• One type A USB 2.0 port• One DH10 connector for serial B port• Six SATA II ports• One port for an optional SAS/SAS ROMB module• One port for an optional remote management module 3
Graphics	On-board ServerEngines LLC Pilot II controller with integrated 2D video controller, 64 MB DDR2 memory, 8 MB of which is graphics memory
LAN	One Intel® 82575EB controller with two ports for 10/100/1000 Mbps Ethernet LAN
Add-in card slots	<ul style="list-style-type: none">• One PCI-E 2.0 x16 slot (x8 connection)• Three PCI-E 2.0 x8 slots• One PCI-E 1.1 x8 slot (with a split SAS module socket x4 connection)• One 5 V 32-bit / 33 MHz PCI slot
Server management	<ul style="list-style-type: none">• An integrated IPMI 2.0-compliant baseboard management controller• Support for remote management module 3 ("KVM over IP")• Support for system management software• Light-Guided Diagnostics on replaceable units (FRUs)

Connector and Header Locations

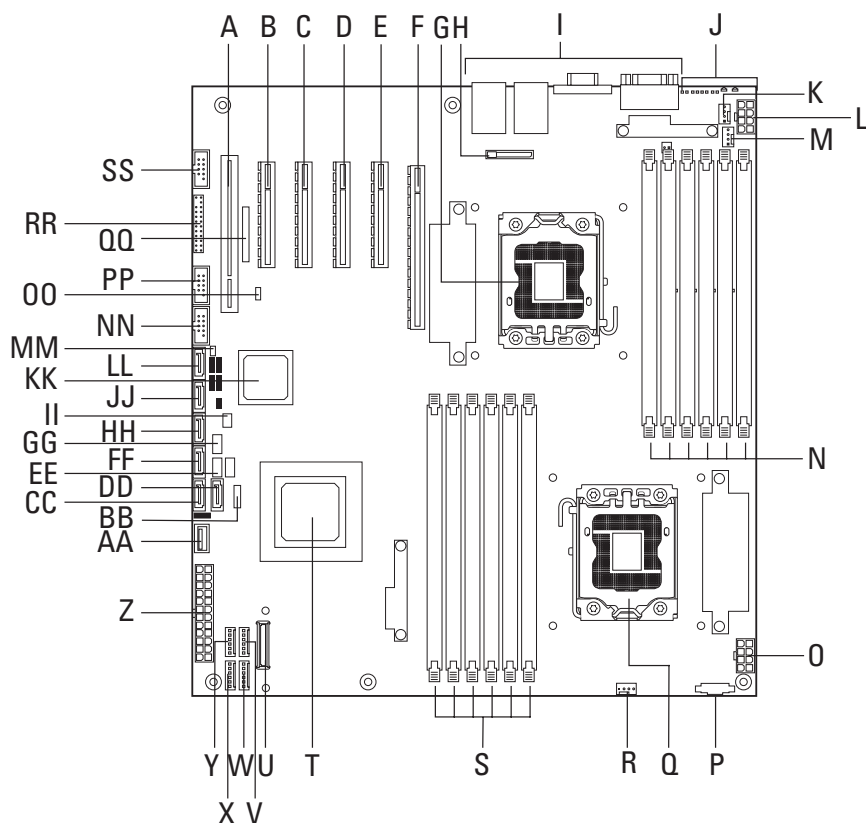


Figure 20. Server Board Connector and Component Locations

A. Slot 1 (PCI, 32-bit, 33 MHz)	P. Aux Power Signal	EE. HSBP B
B. Slot 2 (PCIe x4)	Q. CPU 2 Socket	FF. SATA 2
C. Slot 3 (PCIe2 x8)	R. CPU 2 Fan	GG. HSBP A
D. Slot 4 (PCIe2 x8)	S. DIMM Sockets (CPU 2; see figure 23)	HH. SATA 3
E. Slot 5 (PCIe2 x8)	T. IOH	II. SATA RAID 5 Key
F. Slot 6 (PCIe2 x8)	U. SAS Module Slot	JJ. SATA 4
G. CPU 1 Socket	V. System Fan 3	KK. ICH10
H. CMOS Battery	W. System Fan 4	LL. SATA 5
I. I/O Ports (see page 8, figure 1)	X. System Fan 2	MM. HDD Activity LED
J. Diagnostic LEDs (see page 27, figure 22)	Y. System Fan 1	NN. USB
K. System Fan 5	Z. Main Power	OO. USB SSD
L. CPU 1 Power	AA. Type A USB Port	PP. USB
M. CPU 1 Fan	BB. LCP/IPMB Header	QQ. RMM3 Slot
N. DIMM Sockets (CPU 1; see figure 23)	CC. SATA 1	RR. Front Panel Header
O. CPU 2 Power	DD. SATA 0	SS. Serial Port B

Configuration Jumpers

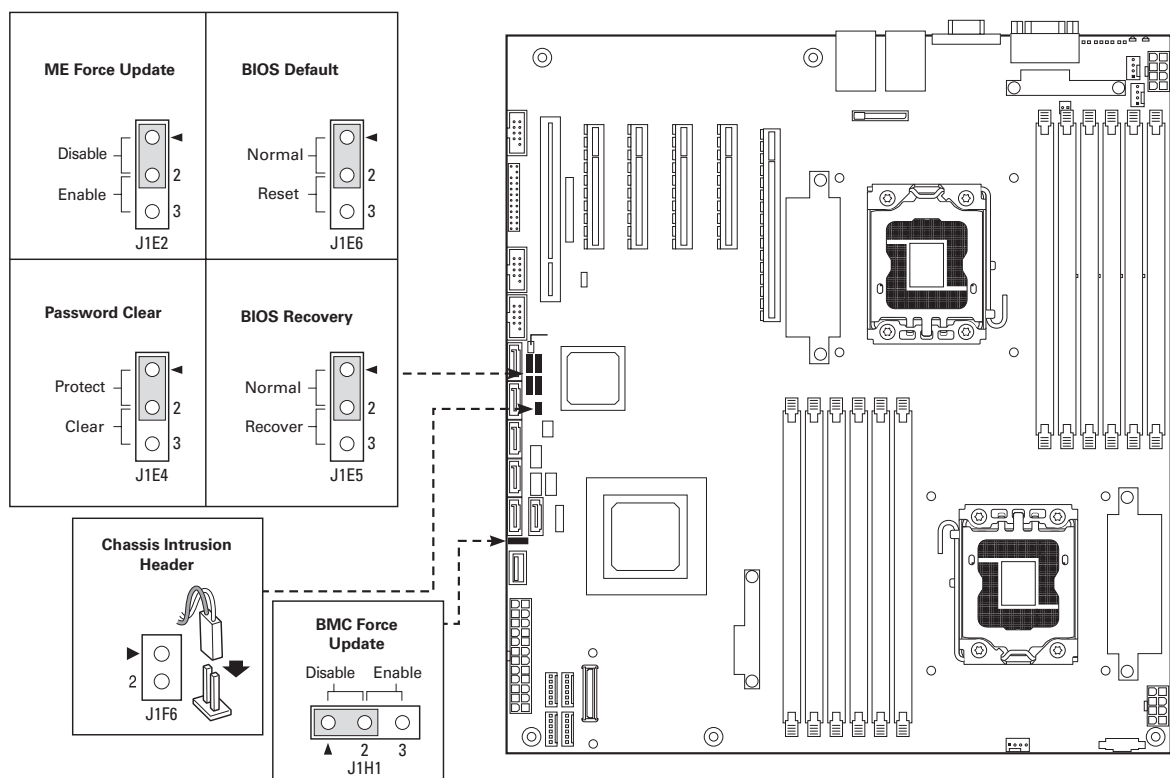


Figure 21. Configuration Jumpers

Jumper Name	Pins	What Happens at System Reset
BIOSD Default (J1E6)	1-2 (Default)	Protect CMOS: These pins should have a jumper in place for normal system operation.
	2-3	If pins 2-3 are connected for 5 to 10 seconds with AC power unplugged, the CMOS settings clear on the next reset. These pins should not be connected for normal operation.
ME Force Update (J1E2)	1-2 (Default)	ME Firmware Force Update Mode – Disabled These pins should have a jumper in place for normal system operation.
	2-3	ME Firmware Force Update Mode – Enabled These pins should not be connected for normal operation.
Password Clear (J1E4)	1-2 (Default)	Protect Password: These pins should have a jumper in place for normal system operation.
	2-3	To clear administrator and user passwords, power on the system with pins 2-3 connected. The administrator and user passwords clear in 5-10 seconds after power on. These pins should not be connected for normal system operation.
BIOS Recovery (J1E5)	1-2 (Default)	These pins should be connected for normal system operation.
	2-3	The main system BIOS does not boot with pins 2-3 connected. The system only boots from EFI-bootable recovery media with a recovery BIOS image present. These pins should not be connected for normal system operation.
BMC Force Update (J1H1)	1-2 (Default)	BMC Firmware Force Update Mode – Disabled. These pins should have a jumper in place for normal system operation.
	2-3	BMC Firmware Force Update Mode – Enabled. These pins should not be connected for normal operation.

Light-Guided Diagnostics

The server board contains diagnostic LEDs to help you identify failed and failing components and to help you identify the server from among several servers. Except for the ID LED, the status LED, and the +5-volt standby LED, the LEDs turn on (amber) only if a failure occurs.

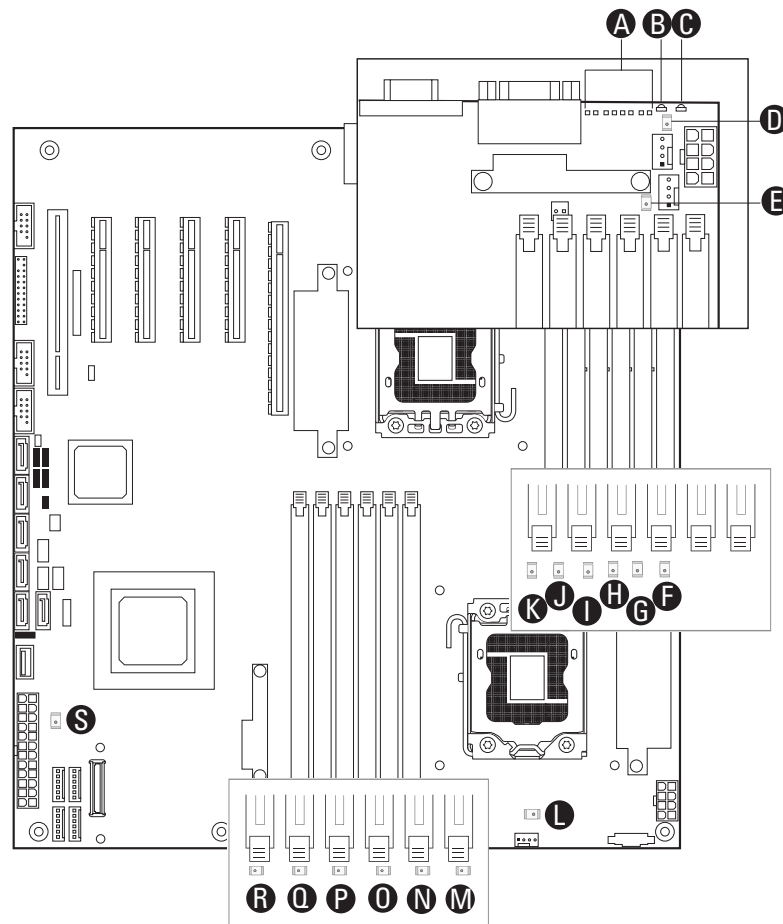


Figure 22. Diagnostic LEDs

Callout	LED	Function
A.	POST LEDs	The sequence of lit POST LEDs is used to identify specific errors that might occur during the boot process. The LED code will help technical support to identify possible problems.
B.	ID LED	This LED can be turned on and off either by pressing a chassis button or by using system management software. This LED is useful when the system is grouped with several systems, such as in a rack, and you need to easily find the system to perform maintenance on it.
C.	Status LED	The status LED indicates whether a system is operating correctly, has experienced a minor fault, or a major system error. This LED shows the same status as the front panel Status LED.
D.	System fan 5 fault LED	This LED indicates a fault has occurred with system fan 5. See your server chassis documentation for instructions to replace the fan.
E. L.	Fault LED for processor 1 fan Fault LED for processor 2 fan	These LEDs are only for server systems that use an active processor heatsink. They indicate when a fault has occurred on the heatsink fan. Replace the faulty unit.

Callout	LED	Function
F. G. H. I. J. K. M. N. O. P. Q. R.	DIMM C1 fault LED DIMM C2 fault LED DIMM B1 fault LED DIMM B2 fault LED DIMM A1 fault LED DIMM A2 fault LED DIMM D2 fault LED DIMM D1 fault LED DIMM E2 fault LED DIMM E1 fault LED DIMM F2 fault LED DIMM F1 fault LED	These LEDs indicate a fault has occurred with the DIMM installed in the corresponding socket. Replace the faulty DIMM.
S.	+5-volt standby LED	This LED is green whenever AC power is applied to the system. The system does not need to be powered on in order for this LED to be on.

RAID Support

The options for hard drive configuration are located in the BIOS Setup under “Advanced” > “Mass Storage Controller Configuration”.

The option “On-board SATA Controller” is enabled as default and allows the following additional “SATA Mode” options:

- “Enhanced” – supports up to six SATA devices in Native IDE mode.
- “Compatibility” – supports up to four SATA ports [0/1/2/3] in Legacy IDE mode and two SATA ports [4/5] in Native IDE mode.
- “AHCI” – supports all SATA ports in Advanced Host Controller Interface mode.
- “SW RAID” – switches on Intel® Embedded Server RAID Technology II mode with support for RAID 0, 1 and 10.

Hardware Requirements

Processor

One or two Intel® Xeon® 5500 processors must be installed.

System memory

The server board provides six memory channels, each with two slots. Channels A to C with DIMM A1, A2, B1, B2, C1 and C2 are assigned to processor 1. Channels D to F with DIMM D1, D2, E1, E2, F1 and F2 are assigned to processor 2. Channels D, E and F can only be used if processor 2 is populated.

If two processors are populated, then they can both access the entire memory via Intel® QuickPath Interconnect (Intel® QPI).

Within a channel, DIMM 1 must be populated before DIMM 2 can be used.

CPU socket 1						CPU socket 2					
Channel A		Channel B		Channel C		Channel D		Channel E		Channel F	
A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2

DIMM configuration is shown in the following figure.

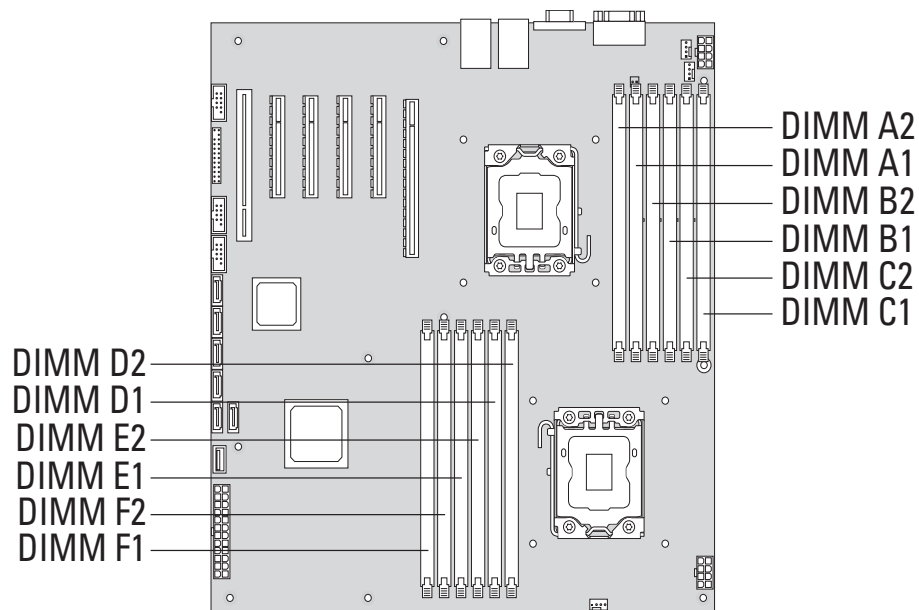


Figure 23. DIMM Sockets

Supported memory modules:

- 1.5 V DDR3 DIMMs, registered (RDIMMs) or unbuffered (UDIMMs, with or without ECC)
- Mixing of RDIMMs and UDIMMs is not permitted
- If at least one UDIMM is installed without ECC, the entire memory is operated without ECC.
- The following DIMM and DRAM technologies are supported:
- RDIMMs:
 - Single, dual and quad rank
 - x4 or x8 DRAM with 1 Gbit and 2 Gbit technology; 2 GB or 4 GB RDIMMs based on 2 Gbit DRAM are not supported
 - DDR3 1333 (only single and dual rank), DDR3 1066 and DDR3 800
- UDIMMs:
 - Single and dual rank
 - x8 DRAM with 1 Gbit or 2 Gbit technology
 - DDR3 1333, DDR3 1066 and DDR3 800

Memory Mirroring

The chipset supports memory mirroring. Memory mirroring is a concept intended to avoid loss of data if one DIMM fails.

The maximum useable memory amounts to half of the installed memory in a mirrored system.

Memory mirroring is achieved by mirroring the first two memory channels of each processor. The third channel (C or F) remains unused.

For memory mirroring, the DIMMs need to have the same capacity and technology across all channels.

Optional Hardware

Remote Management Module

The Remote Management Module provides extended functions for server management. A network card is provided specifically for remote access.

5 Hardware Installations and Upgrades

Before You Begin

Before working with your server product, pay close attention to the safety information in 'Server Position' at the beginning of this manual.

Tools and Supplies Needed

- Phillips (cross head) screwdriver (#1 bit and #2 bit)
- Needle-nosed pliers
- Anti-static wrist strap and conductive foam pad (recommended)

Installing and Removing Memory

The DIMMs are labelled as DIMM_A1 to DIMM_F2 on the board.

Begin populating your memory with DIMM_A1. First add memory in the first socket of each of the following memory channels before installing the DIMMs in the second socket of a channel. In systems with two processors, distribute the memory evenly over both processors. Please refer to Chapter 4 for more detailed information on the system memory.

Installing DIMMs

To install DIMMs, follow these steps:

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord(s) from the server.
4. Remove the chassis cover.
5. Remove the memory and processor air duct.
6. Locate the DIMM sockets (see Figure 23 on page 29).
7. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position.
8. Holding the DIMM by the edges, remove it from its anti-static package.
9. Position the DIMM above the socket. Align the small notch in the bottom edge of the DIMM with the key in the socket.
10. Insert the bottom edge of the DIMM into the socket.
11. When the DIMM is inserted, carefully push straight down on the top edge of the DIMM until the retaining clips snap into place. Make sure the clips are firmly in place.
12. Reinstall the memory and processor air duct.
13. Replace the chassis cover and reconnect the AC power cord(s).

Installing or Replacing the Processor



CAUTIONS

Processor must be appropriate: You may damage the server board if you install a processor that is inappropriate for your server.

ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.

Installing the Processor

To install a processor, follow these instructions:

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord(s) from the server.
4. Remove the chassis cover.
5. Remove the memory and processor air duct.
6. Locate the processor sockets (see Figure 20 on page 24).
7. Disconnect and remove any components necessary to access the processor sockets.
8. Push down the lever on the processor socket. While pushing downward, push it away from the socket to release it from the hook. Open the socket lever completely. See figure 24.

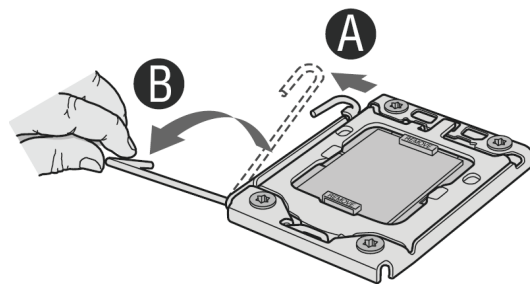


Figure 24. Opening the Processor Socket Lever

9. Push the rear tab with your fingertip to bring the front end of the load plate up slightly. Open the load plate completely. See figure 25.

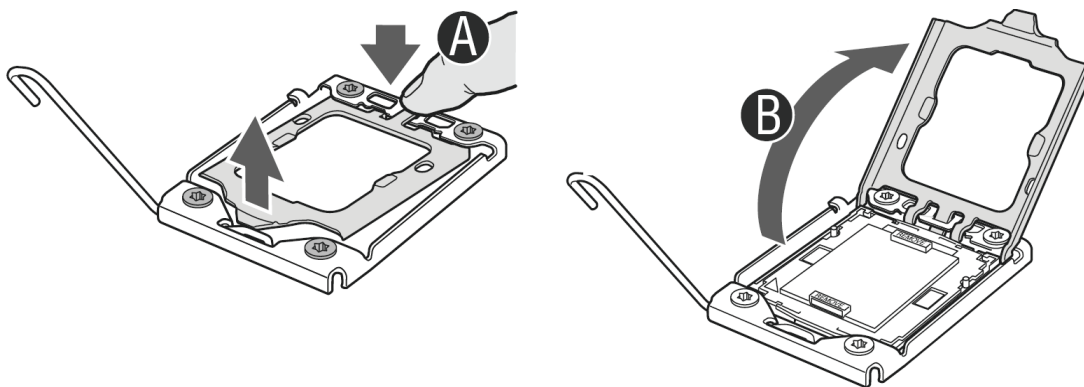


Figure 25. Opening Load Plate

10. If there is a protective covering on the load plate, remove it and store it for later use.

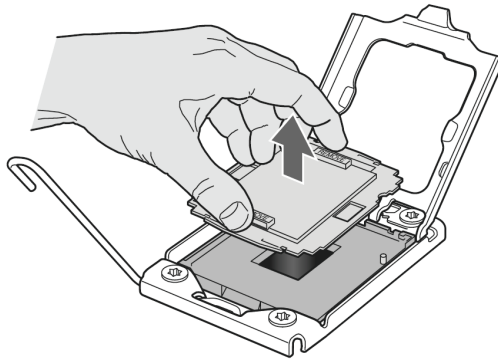


Figure 26. Removing Protective Covering from the Load Plate

11. Take the processor out of the box and remove the protective shipping covering.
12. Align the processor with the socket in such a way that both notches match up with the processor socket pins. Gently insert the processor into the socket.

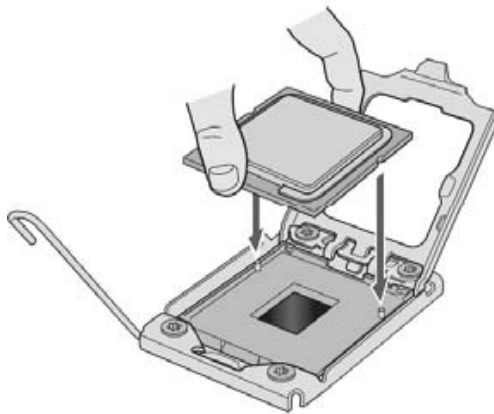


Figure 27. Inserting the Processor

13. Replace the load plate.
14. Close the socket lever. Push down on the lever and, while holding it down, push it towards the centre of the processor until it clicks into place under the hook on the processor socket.

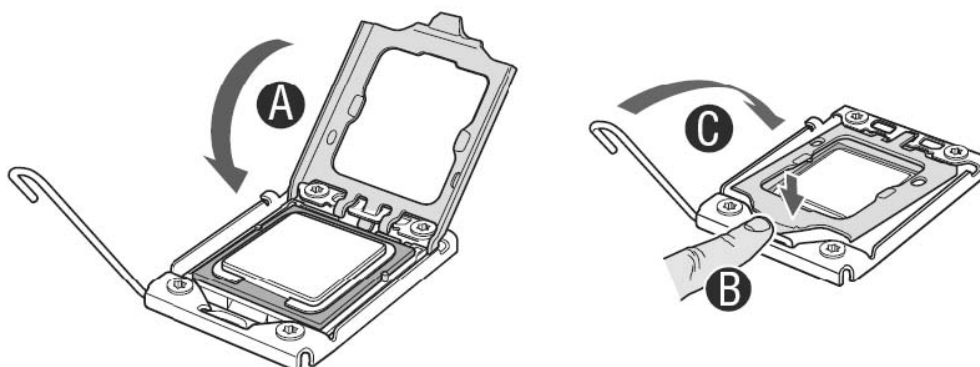


Figure 28. Close and Lock Load Plate

15. Attach the heat sink (see next page).

Installing the Heatsink(s)

1. The heat sink has Thermal Interface Material (TIM) located on the bottom of it. Use caution when you unpack the heat sink so you do not damage the TIM.
2. Set the heat sink over the processor, lining up the four captive screws with the four posts surrounding the processor.
3. Loosely screw in the captive screws on the heat sink corners in a diagonal manner. Do not fully tighten one screw before tightening another.
4. Gradually and equally tighten each captive screw until all screws are tight.

Removing a Processor

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Remove the AC power cord(s) from the server.
4. Remove the chassis cover.
5. Remove the memory and processor air duct.
6. Loosen the four captive screws on the corners of the heat sink.
7. Twist the heat sink slightly to break the seal between the heat sink and the processor.
8. Lift the heat sink from the processor. If it does not pull up easily, twist the heat sink again. Do not force the heat sink from the processor. Doing so could damage the processor.
9. Lift the processor lever.
10. Remove the processor.
11. If installing a replacement processor, see "Installing the Processor." Otherwise, reinstall the memory and processor air duct and the chassis cover.

Installing or Removing a PCI Card

PCI cards can be installed into slots 1, 2, 3, 4, 5, and 6.

WARNING

Do not attempt to install or remove a PCI card without first turning off the system and disconnecting the power supply to the power supply module.

1. Remove chassis cover.
2. From inside, open the latch on the blue PCI card socket at the rear of the chassis (see figure).

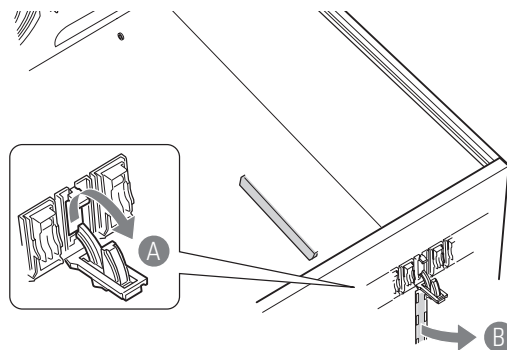


Figure 29. Preparing the Chassis for PCI Card Installation

3. To install a PCI card, push the slot cover out from the rear of the chassis from inside.

Replacing the Backup Battery

The lithium battery on the server board powers the RTC for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.



WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.



ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.



VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.



VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.



OSTRZEŻENIE

Nieprawidłowa wymiana baterii grozi eksplozją. Wymieniać tylko na taki sam lub równoważny typ, zalecany przez producenta. Zużyte baterie utylizować zgodnie z instrukcjami producenta.



WARNUNG

Wenn eine ungeeignete Batterie eingesetzt wird oder die Batterie falsch eingesetzt wird, besteht Explosionsgefahr. Ersetzen Sie verbrauchte Batterien nur durch Batterien gleichen oder äquivalenten Typs, der vom Hersteller empfohlen wurde. Entsorgen Sie die verbrauchte Batterie entsprechend den Anweisungen des Herstellers.



AVERTISSEMENT

Danger d'explosion en cas de remplacement incorrect de la pile. Remplacez-la uniquement par une pile du même type ou d'un type équivalent recommandé par le fabricant. Mettez au rebut les piles usagées en vous conformant aux instructions du fabricant.

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord(s) from the server.
4. Remove the chassis cover and locate the battery.
5. Push the metal lever over the top of the battery to the side to disengage it from the battery.
6. While holding the lever away from the battery, lift the battery from its socket.

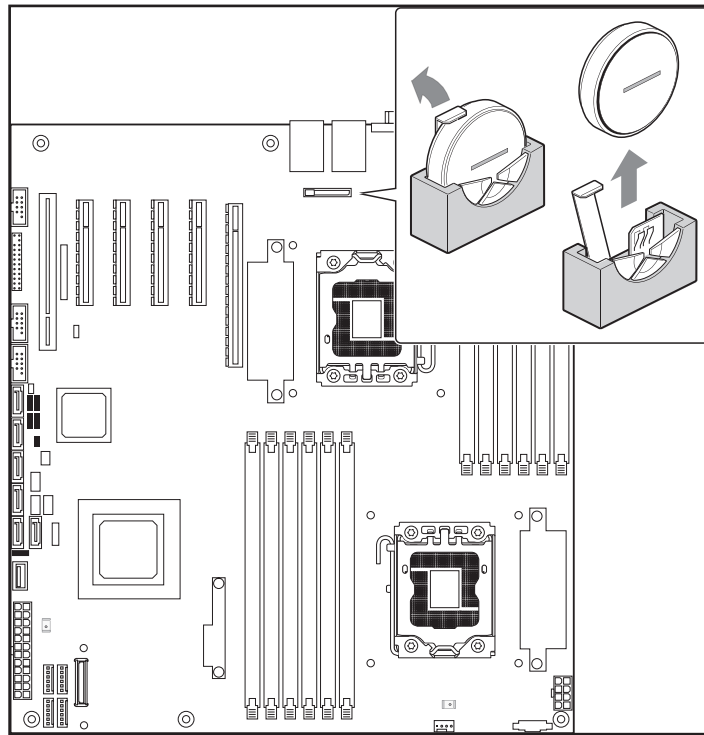


Figure 30. Replacing the Backup Battery

7. Dispose of the old battery according to local ordinance.
8. Remove the new lithium battery from its package, and observe the correct polarity. The printed side of the battery must face up, or toward the DIMM slots.
9. Insert the battery in the socket.
10. Close the chassis.
11. Run Setup to restore the configuration settings to the RTC.

Clearing the Password

If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the "clear" position clears both passwords. The password clear jumper must be restored to its original position before a new password(s) can be set.

1. Power down the server. Do not unplug the power cord.
2. Open the server chassis.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the Password Clear position (covering pins 2 and 3).

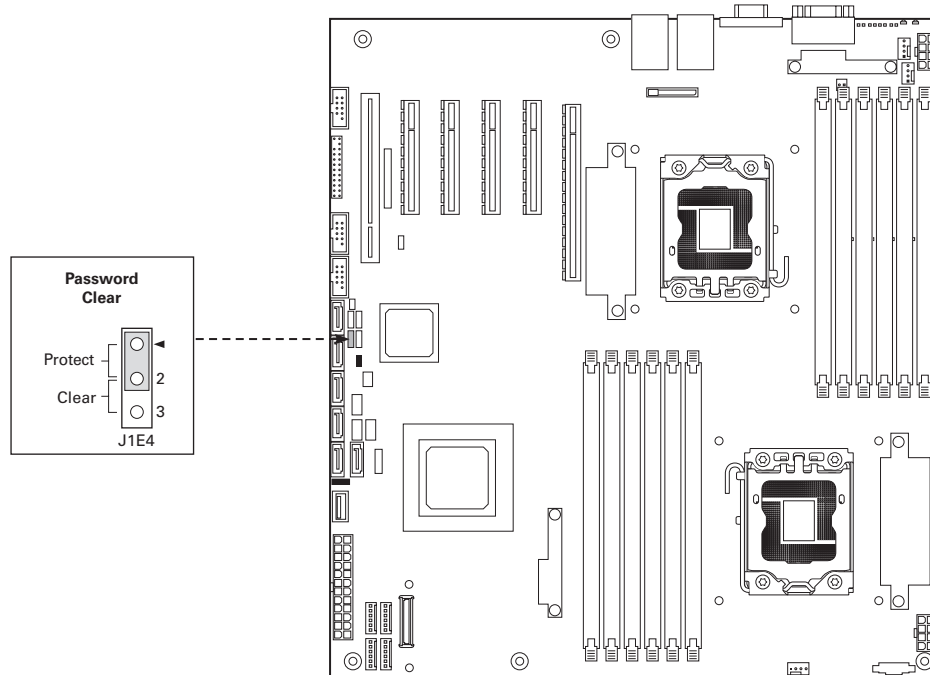


Figure 31. Password Clear Jumper

4. Close the server chassis.
5. Power up the server and wait 10 seconds.
6. Power down the server.
7. Open the server chassis and move the jumper back to the default position (covering pins 1 and 2).
8. Close the server chassis.
9. Power up the server.

Recovering BIOS Defaults

If you are not able to access the BIOS setup screens, the BIOS Defaults jumper will need to be used to reset the system configuration.

1. Power down the system and unplug the power cord.
2. Open the server chassis.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the reset/clear position (covering pins 2 and 3).

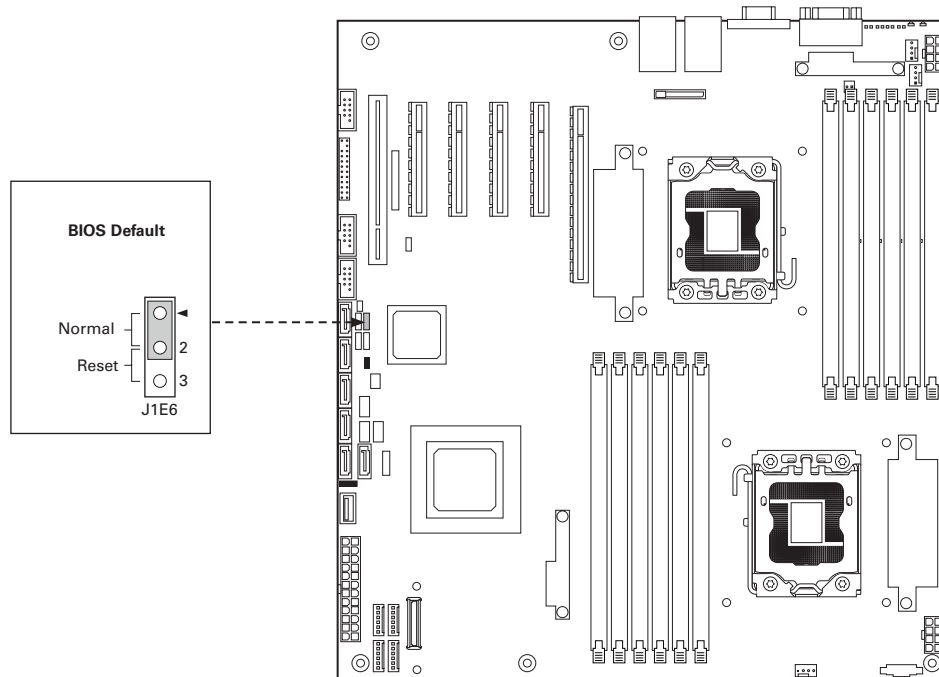


Figure 32. BIOS Defaults Jumper

4. Wait 5 seconds.
5. Move the jumper back to the default position (covering pins 1 and 2).
6. Close the server chassis.
7. Power up the server.

6 Server Utilities

Using the BIOS Setup Utility

This section describes the BIOS Setup Utility options, which is used to change server configuration defaults. You can run BIOS Setup with or without an operating system present.

Starting Setup

You can enter and start BIOS Setup under several conditions:

- When you turn on the server, after POST completes the memory test
- When you have moved the CMOS jumper on the server board to the “Clear CMOS” position (enabled)

In the two conditions listed above, after rebooting, you will see this prompt:

```
Press <F2> to enter SETUP
```

In a third condition, when CMOS/NVRAM has been corrupted, you will see other prompts but not the <F2> prompt:

```
Warning: CMOS checksum invalid
```

```
Warning: CMOS time and date not set
```

In this condition, the BIOS will load default values for CMOS and attempt to boot.

If You Cannot Access Setup

If you are not able to access BIOS Setup, you might need to clear the CMOS memory. For instructions on clearing the CMOS, see “Clearing the CMOS”.

Setup Menus

Each BIOS Setup menu page contains a number of features. Except for those features that are provided only to display automatically configured information, each feature is associated with a value field that contains user-selectable parameters. These parameters can be changed if the user has adequate security rights. If a value cannot be changed for any reason, the feature’s value field is inaccessible.

Table 5 describes the keyboard commands you can use in the BIOS Setup menus.

Table 5. Keyboard Commands

Press	Description			
<F1>	Help - Pressing F1 on any menu invokes the general Help window.			
← →	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a sub menu or pick list is displayed.			
↑	Select Item up -The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.			
↓	Select Item down -The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.			
F5/-	Change Value -The minus key or the F5 function key is used to change the value of the current item to the previous value.This key scrolls through the values in the associated pick list without displaying the full list.			
F6/+	Change Value -The plus key or the F6 function key is used to change the value of the current menu item to the next value.This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but it has the same effect.			
<Enter>	Execute Command -The Enter key is used to activate submenus when the selected feature is a sub menu, or to display a pick list if a selected feature has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the Enter key will undo the pick list, and allow another selection in the parent menu.			
<Esc>	Exit -The ESC key provides a mechanism for backing out of any field.This key will undo the pressing of the Enter key. When the ESC key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When the ESC key is pressed in any sub menu, the parent menu is re-entered. When the ESC key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded.			
<F9>	<p>Setup Defaults - Pressing F9 causes the following to appear:</p> <table><tr><td>Setup Confirmation</td></tr><tr><td>Load default configuration now?</td></tr><tr><td>[Yes] [No]</td></tr></table> <p>If “Yes” is selected and the Enter key is pressed, all Setup fields are set to their default values. If “No” is selected and the Enter key is pressed, or if the ESC key is pressed, the user is returned to where they were before F9 was pressed without affecting any existing field values.</p>	Setup Confirmation	Load default configuration now?	[Yes] [No]
Setup Confirmation				
Load default configuration now?				
[Yes] [No]				
<F10>	<p>Save and Exit - Pressing F10 causes the following message to appear:</p> <table><tr><td>Setup Confirmation</td></tr><tr><td>Save Configuration changes and exit now?</td></tr><tr><td>[Yes] [No]</td></tr></table> <p>If “Yes” is selected and the Enter key is pressed, all changes are saved and Setup is exited. If “No” is selected and the Enter key is pressed, or the ESC key is pressed, the user is returned to where they were before F10 was pressed without affecting any existing values.</p>	Setup Confirmation	Save Configuration changes and exit now?	[Yes] [No]
Setup Confirmation				
Save Configuration changes and exit now?				
[Yes] [No]				

7 Technical Reference

Power Supply Specifications

670-W Single Power Supply Input Voltages

- 100-127 V~ at 50/60 Hz; 12 A max.
- 200-240 V~ at 50/60 Hz; 7 A max.

670-W Single Power Supply Output Voltages

The table below lists the total wattage available from the power subsystem for each voltage. If you configure your system heavily, ensure that your loads do not exceed the combined total wattage of 670 Watts.

Table 6. 670-W Power Supply System Output Capability

Voltage	Maximum Current
+3.3 V	24 A
+5 V	30 A
+5 V Standby	3 A
+12 V (4 rails)	48 A (16 A for one rail)
-12 V	0.5 A



CAUTION

The expansion slots on the server board are rated for no more than 25 Watts for any one slot. The average current usage per slot should not exceed 13 Watts.

750 W Redundant Power Supply Input Voltages

- 100-127 V~ at 50/60 Hz; 12 A max.
- 200-240 V~ at 50/60 Hz; 6 A max.

Efficiency

The following table shows the efficiency of the power supply with an input voltage of 230 V.

Table 7. Efficiency of the Power Supply

Load (% of maximum)	20%	50%	100%
Efficiency	85%	89%	85%

750 W Redundant Power Supply Output Voltages

The table below lists the total wattage available from the power subsystem for each voltage.

Table 8. 750 W Power Supply Output Rating

Voltage	Maximum Current
+3.3 V	25 A
+5 V	30 A
+5 V standby	3 A
+12 V (4 rails)	24 A / 24 A / 16 A / 16 A
-12 V	0.5 A



CAUTION

The expansion slots on the server board are rated for no more than 25 Watts for any one slot. The average current usage per slot should not exceed 13 Watts.

System Environmental Specifications

Table 9. Environmental Specifications

Temperature	Non-operating	–40 °C to 70 °C.
	Operating	5 °C to 30 °C; derated 0.5 °C for every 1000 ft (305 m) to a maximum of 10,000 ft.
Humidity	Non-operating	90 % relative humidity (non-condensing) at 30 °C.
Shock	Operating	2.0 g, 11 msec, 1/2 sine
	Packaged	Operational after an 18" free fall.
Acoustic noise		6 Bels in sound power for a typical office ambient temperature.
Electrostatic discharge (ESD)		Tested to 15 kilovolts (kV); no component damage.

8 Regulatory and Integration Information

Product Regulatory Compliance

Product Safety Compliance

The server complies with the following safety requirements:

- EN 60950 (European Union)
- IEC 60950 (International)
- CE – Low Voltage Directive (73/23/EEC) (European Union)

Product EMC Compliance

The server has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations:

- EN 55022 (Class A) – Radiated & Conducted Emissions (European Union)
- EN 55024 (Immunity) (European Union)
- CE – EMC Directive (89/336/EEC) (European Union)

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Table 10. Product Certification Markings

CE Mark	
---------	--

Product RoHS Compliance

Restriction of Hazardous Substances: This server system is compliant to European Directive 2002/95/EC (RoHS).

Installation Precautions

Observe all warnings and cautions in the installation instructions.

To avoid injury, be careful of:

- Sharp pins on connectors
- Sharp pins on printed circuit assemblies
- Rough edges and sharp corners on the chassis
- Hot components (like processors, voltage regulators, and heat sinks)
- Damage to wires that could cause a short circuit

Refer computer servicing to qualified technical personnel.

Installation Requirements



CAUTION

Follow these guidelines to meet safety and regulatory requirements when installing this board assembly.

Read and adhere to all of these instructions and the instructions supplied with the chassis and associated modules. If the instructions for the chassis are inconsistent with these instructions or the instructions for associated modules, contact the supplier's technical support to find out how you can ensure that your computer meets safety and regulatory requirements. If you do not follow these instructions and the instructions provided by chassis and module suppliers, you increase safety risk and the possibility of noncompliance with regional laws and regulations.

Prevent Power Supply Overload

Do not overload the power supply output. To avoid overloading the power supply, make sure that the calculated total current loads of all the modules within the computer is less than the output current rating of each of the power supplies output circuits.

Place Battery Marking

There is insufficient space on this server board to provide instructions for replacing and disposing of the battery. For system safety certification, the following statement or equivalent statement may be required to be placed permanently and legibly on the chassis near the battery.



CAUTION

Risk of explosion if battery is incorrectly replaced.

Replace with only the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Use Only for Intended Applications

This server was evaluated as Information Technology Equipment (I.T.E.) for use in offices, homes, schools, computer rooms, and similar locations. The suitability of this product for other applications or environments, (such as medical, industrial, alarm systems, test equipment, etc.) may require further evaluation.

Power and Electrical Warnings



CAUTION

The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

To avoid risk of electric shock, turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it.

The power supply cord(s) is/are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.

The power supply cord(s) must be plugged into socket-outlet(s) that is/are provided with a suitable earth ground.

Rack Mount Warnings

The equipment rack must be anchored to an unmovable support to prevent it from tipping when a server or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.

Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack.

Extend only one piece of equipment from the rack at a time.

You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.